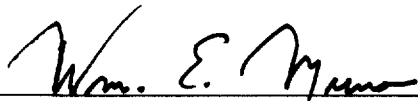


**FIVE YEAR REVIEW REPORT**  
**HI-MILL MANUFACTURING SITE**  
**HIGHLAND TOWNSHIP, MICHIGAN**

Pursuant to CERCLA  
42 U.S.C. Section 9621

**Prepared by:**  
**U.S. Environmental Agency**  
**Region 5**  
**Chicago, Illinois**

  
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8/25/00  
Date

## **I. INTRODUCTION**

### **A. Authority and Purpose**

The U.S. Environmental Protection Agency (U.S. EPA), Region 5, conducted this statutory five-year review under Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Statutory reviews are conducted at sites at which hazardous substances, pollutants, or contaminants remain above levels that allow for unlimited use and unrestricted exposure following completion of all remedial action and where the Record of Decision (ROD) was signed after October 17, 1986 (the effective date of SARA). Consequently, U.S. EPA will ensure that all remedies requiring any engineering controls, or access or land-use restrictions or controls are reviewed, including remedies that attain protective levels for the current use, but which include restrictions on activities due to limits on possible future exposure. This is a Level I review, and copies of this document will be available at the local information repository and at U.S. EPA Region 5 office in Chicago.

### **B. Site History**

Since its formation in 1946, Hi-Mill Manufacturing Company has fabricated copper, aluminum and brass tubing parts and fittings. Production operations have included cutting, machining, forming, shaping and soldering of the raw tubing and fabricated tubing components. Support operations have included nitric and sulfuric acid cleaning and pickling, chromic acid washing, and degreasing.

From about 1960 to 1981 process wastewaters (containing metals) were discharged to an unlined lagoon located southeast of the main production building. In 1976 a second, smaller lagoon was constructed south of the original lagoon. In 1976 and 1977 Michigan Department of Natural Resources (MDNR) staff observed direct overflows of the second lagoon to the nearby marsh. Hi-Mill was asked by MDNR to apply for an NPDES permit for the discharges. A proposed permit was issued by MDNR on September 16, 1977, but U.S. EPA refused to concur with the issuance of the permit. In December 1977 Hi-Mill agreed to design and implement a wastewater recycle system and cease discharging to the lagoons.

The wastewater recycle system was fully operational in 1981, and subsequent discharges to the lagoons were terminated. Between 1981 and 1983 Hi-Mill attempted to evaporate the water remaining in the lagoons by intermittently discharging it through spray nozzles attached to the roof of the production building and to portions of the fence that surrounds the rear of the site. All wastewater that could not be recycled was pumped to an underground, concrete holding tank. When this tank became full, the wastewater was transported by a licensed waste transporter to a permitted hazardous waste treatment facility.

In September 1983 Hi-Mill requested permission from MDNR to remove the sludge from the larger lagoon, excavate surrounding soils, and backfill the area with clean fill. Contaminated

soils were removed from the sides and bottom of the large lagoon, and then an additional one foot of clay was excavated from the bottom of the lagoon to ensure removal of all contaminated soils. This was completed in December 1983. The excavation contractor indicated that the smaller lagoon was not apparent during the excavation; the fate of this impoundment is not known.

Degreasing of fabricated tubular parts has been a part of Hi-Mill's process since prior to 1970. Trichloroethylene (TCE) was received and stored in an aboveground tank located approximately fifty feet east of the production building and the east water well. Solvent was transferred to the degreasing equipment inside the plant via underground piping. Between 1978 and 1980 (exact date unknown), activities related to the construction of an addition on the northeast side of the building resulted in the damage of the solvent delivery line between a former aboveground storage tank and degreaser.. As a result of the damage, a maximum of 250 gallons of solvent leaked from the damaged underground product line. The product loss was discovered the following work day, and the damaged underground product line was replaced with an aboveground product line. In 1986, a second TCE storage tank was constructed in a diked containment area immediately west of the production building and approximately 25 feet south of the west water well. In the summer of 1988, the original, east tank and associated piping were removed and disposed. Hi-Mill terminated the use of TCE in their manufacturing process ~~between 1989 and 1992.~~

In 1988 the Oakland County Health Department found volatile organic compounds (VOCs) in Hi-Mill's Process Wells located in the intermediate aquifer. These wells provided drinking water to workers at the plant. On February 21, 1990, the Hi-Mill site was placed on U.S. EPA's National Priorities List. From 1989 to 1992, Hi-Mill conducted a remedial investigation and feasibility study (RI/FS) under an administrative order on consent dated October 5, 1988. The RI/FS report states that shallow groundwater below the site and nearby areas is contaminated with VOCs, including trichloroethene (TCE); 1,2-dichloroethene (1,2-DCE); and vinyl chloride. The primary sources of the VOC contamination are believed to be the accidental release of 250 gallons of solvent from a TCE delivery line and releases from former TCE storage tanks. The RI/FS reported that the intermediate aquifer showed no evidence of contamination. Sediment and surface water samples collected from Target Pond and a nearby lake during the RI/FS revealed no significant impacts from site-related contamination, however, these samples were analyzed for metals only and not VOCs.

Based on the RI/FS results, U.S. EPA issued a "No Action with Groundwater Monitoring and Institutional Controls" ROD for the site on September 28, 1993. The selected remedy includes; (1) Long-term groundwater monitoring of the shallow and intermediate aquifers for VOCs; (2) Long-term monitoring of nearby surface water bodies for VOCs; (3) Quarterly monitoring of the groundwater for the first three years after which a reduced frequency will be considered; (4) Institutional controls to restrict development of the property for residential use. According to the ROD, long-term monitoring was designated for the site for the following reasons: (1) Although the shallow groundwater unit onsite and off-site is contaminated with relatively high levels of organics, this groundwater unit cannot be used as a drinking water source now or in the future

due to its low water yield; there are no beneficial uses for the shallow groundwater unit; (2) The intermediate aquifer, which is a potable water source, showed no signs of contamination; (3) The only potential risks due to site contamination are found under the future residential scenario and the likelihood of the Hi-Mill property, which has been industrial since the 1940s, being developed for residential purposes in the future is low; (4) The complex geology of the shallow groundwater unit may make treatment of the contaminated groundwater difficult. The state of Michigan did not concur with the ROD because it felt that the extent and fate of the contamination had not been adequately determined and that until it was, it was not possible to quantify the risks or potential risks posed by the contamination. Thus the state believes that it was not possible for U.S. EPA to make an informed decision on the most appropriate remedy for the site that would be protective of human health and the environment.

A consent decree for the site was issued on December 7, 1994. Institutional controls were implemented on December 22, 1994, and installation of additional monitoring wells was completed in September 1995. As part of operation and maintenance (O&M) activities at the site, Hi-Mill has sampled monitoring wells quarterly since October 1995. The ROD states that if quarterly sampling results show that site contamination is adversely impacting nearby surface water bodies or the intermediate aquifer, a treatment alternative will be evaluated.

On April 6, 2000, Hi-Mill proposed to conduct a voluntary remedial action on the contaminated shallow groundwater. The objective of the remedial action is to reduce TCE concentrations in the groundwater so that groundwater monitoring can be reduced and potentially eliminated. Hi-Mill evaluated several innovative technologies and proposed chemical oxidation using potassium permanganate (KMnO<sub>4</sub>) for the remediation of the source area around the former TCE tank and enhancing anaerobic conditions in the aquifer for the remediation of lower concentrations of TCE further from the source area.

On May 29, 2000, Hi-Mill petitioned U.S. EPA to reduce the frequency of groundwater monitoring from quarterly to annual, except for 2 wells that would be sampled quarterly and 3 wells that would be sampled semi-annually. In July, 2000 U.S. EPA approved Hi-Mill's petition to reduce groundwater monitoring in most wells to annually except for 2 wells that would be sampled quarterly and 3 wells which would be sampled semi-annually.

## **II. DISCUSSION**

### **A. Remedial Objectives**

According to the Final Response Design Plan (RDP) dated March 1995, the overall objective of the response action is to minimize environmental and public health impacts from the site. This will be accomplished by long-term monitoring of ground water and deed restrictions.

## **B. ARAR Review**

The “no-action” decision made in the 1993 Record of Decision (ROD) was based on the results of the risk assessment. As stated on page 9 of the ROD, “...the risk assessment shows there is no health risk to current workers from exposure to site soils or groundwater and no health risk to future residents from exposure to site soil. ...based on the fact that the shallow groundwater unit cannot be used as a drinking water source due to its low water yield and that the land use has been industrial for nearly 50 years, the probability of a future residential scenario occurring at this site is low.” Because the exposure pathway (ingestion of groundwater by future residential users) was considered to be too conservative under the circumstances, U.S. EPA determined that no action is appropriate. Thus ARARs were not analyzed for the selected remedy. Section B, number 2 on page 13 of the 1993 ROD states that “there are no ARARs associated with [the selected alternative] since there are no reasonable potential risks due to site contamination.” Because the likelihood of future residential users of shallow groundwater continues to be very low, U.S. EPA continues to believe that this remedy is protective, and there is no need to re-evaluate ARARs at this time.

## **C. Remedial Action**

The 1993 ROD requires long-term monitoring of groundwater and surface water for VOCs and institutional controls. Groundwater monitoring has been conducted quarterly since October, 1995. Groundwater monitoring results indicate that groundwater contaminant levels in the shallow aquifer have increased significantly since the RI/FS was completed; however, as discussed below, the contamination does not appear to be migrating away from the site, nor to nearby water bodies, nor to the intermediate aquifer.

### Migration Away from Site

Potential migration of groundwater contaminants away from the site is monitored using off-site shallow monitoring wells SW-2, SW-4, SW-9A, SW-10, SW-11, SW-14, SW-23, SW-24, SW-25, SW-26A, SW-27, and SW-28. Because wells SW-4, SW-9A, SW-10, SW-11, SW-14, and SW-25 also monitor migration toward surface water bodies, those wells will be addressed in the following section.

Of samples collected from wells SW-2, SW-23, SW-24, SW-26A, SW-27, and SW-28 since October 1998, TCE or its degradation products have been detected only in samples collected from well SW-24. Specifically, TCE has been detected in all 18 samples collected from SW-24 since October 1995, and cis-1,2-DCE has been detected in 16 of the 18 samples. No statistically significant trends were identified for the contaminant concentrations detected in well SW-24 using the statistical method described in Section 4.0 of the Final Response Design Plan (3/21/95) (RDP). Because (1) no significant trends were identified for the contaminant concentrations in well SW-24 and (2) site-related contaminants have not been detected at monitoring wells SW-2, SW-23, SW-26A, SW-27, and SW-28 since October 1998, site-related groundwater contamination does not appear to be migrating off site past well SW-24. (See attached site map.)

#### Migration Toward Nearby Water Bodies

Surface water samples have not been collected as part of O&M activities at the site; however, potential migration of groundwater contaminants to nearby surface water bodies is monitored using off-site shallow monitoring wells SW-4, SW-9A, SW-10, SW-11, SW-14, and SW-25.

TCE was detected in samples collected from well SW-9A only during the October 1995 and January 1996 sampling events at concentrations of 1.6 and 15 micrograms per liter ( $\mu\text{g/L}$ ), respectively; the maximum contaminant level (MCL) for TCE is 5  $\mu\text{g/L}$ . TCE has not been detected in this well since January 1996. Also, as noted below, no statistically significant trends were identified for the contaminant concentrations detected in well SW-9A using the statistical method described in Section 4.0 of the RDP.

At well SW-10, cis-1,2-DCE has been detected in 16 of 18 samples collected. The concentrations of cis-1,2-DCE has been less than or equal to 12  $\mu\text{g/L}$  in all the samples; the MCL for cis-1,2-DCE is 70  $\mu\text{g/L}$ . In addition, vinyl chloride has been detected in 4 of 18 samples collected from well SW-10 at concentrations less than or equal to 2.6  $\mu\text{g/L}$ ; the MCL for vinyl chloride is 2  $\mu\text{g/L}$ . At well SW-25, 1,2-dichloroethane (1,2-DCA) has been detected in the sample collected during the October 1995 sampling event at a concentration of 1.1  $\mu\text{g/L}$ ; the MCL for 1,2-DCA is 5  $\mu\text{g/L}$ . Chloroethane has been detected in 9 of 109 samples collected from SW-4, SW-9A, SW-10, SW-11, SW-14, and SW-25, with the most recent detection being in a sample collected during the July 1997 event from well SW-9A. The concentration of chloroethane in these samples has been less than or equal to 2  $\mu\text{g/L}$ ; there is no MCL for chloroethane.

No sample collected from any of the six wells specified above has contained a contaminant at a concentration that exceeds the MCL for that contaminant since October 1998. In addition, no statistically significant trends were identified for the contaminant concentrations detected in wells SW-4, SW-9A, SW-10, SW-11, SW-14, and SW-25 using the statistical method described in Section 4.0 of the RDP. Because (1) no significant trends were identified and (2) the contaminant concentrations detected in samples collected from the wells were below or near applicable MCLs and have not exceeded applicable MCLs since October 1998, site-related groundwater contamination does not appear to be further migrating toward or impacting nearby surface water bodies at this time.

#### Migration to Intermediate Aquifer

Water quality in the intermediate aquifer is monitored using intermediate monitoring wells IW-1, IW-2, IW-3, IW-4A, IW-5, IW-8, and IW-9. TCE was detected (1) in the sample collected from well IW-1 during the July 1997 sampling event at a concentration of 1.3  $\mu\text{g/L}$  and (2) in the sample collected from well IW-9 during the April 1998 sampling event at a concentration of 2  $\mu\text{g/L}$ . Chloroethane has been detected in 5 of 133 samples collected from wells IW-1, IW-2, IW-3, IW-4A, IW-5, IW-8, and IW-9, with the most recent detection being in a sample collected during the October 1996 event from well IW-5. The concentration of chloroethane in these samples has been less than or equal to 4.7  $\mu\text{g/L}$ ; there is no MCL for chloroethane.

Because no site-related contaminant has been detected in a sample collected from an intermediate well (1) since April 1998 and (2) at a concentration that exceeds the applicable MCL, site-related groundwater contamination does not appear to be migrating to or impacting the intermediate aquifer.

### **III. SUMMARY OF SITE VISIT**

On May 11, 2000, the U.S. EPA Remedial Project Manager (RPM) and a representative from Tetra Tech, U.S. EPA's contractor conducted a site visit. A tour of the Hi-Mill manufacturing facility was given to U.S. EPA, including information regarding Hi-Mill's former practice of utilizing TCE to wash the tubing it manufactures. Hi-Mill's contractor, Conestoga-Rovers (CRA), was also on-site that day as well as a representative from the Michigan Department of Environmental Quality (MDEQ). CRA was installing Gore-Sorber Soil Gas Screening Tubes as part of the scoping effort before beginning the voluntary remedial action. Site conditions did not appear to have changed since the Record of Decision was signed in 1993.

### **IV. RECOMMENDATIONS**

Hi-Mill is currently conducting a soil gas survey and installing 2 additional monitoring wells as part of the voluntary remedial action. Hi-Mill hopes to lower the levels of VOCs in the shallow aquifer such that groundwater monitoring may be significantly reduced or eliminated. Hi-Mill intends to implement the remedy this summer, and results should be known within 3 to 6 months of the initial application of potassium permanganate. U.S. EPA has approved the voluntary remedial action and intend to re-evaluate site conditions upon completion of the action.

### **V. STATEMENT OF PROTECTIVENESS**

Quarterly groundwater monitoring over the past 4 years indicates that the plume does not appear to be migrating, but the concentrations of contaminants are not dropping significantly. Since VOC concentrations in the shallow aquifer are high, U.S. EPA is concerned about the site, however, since groundwater does not appear to be migrating, the current remedy (long term groundwater monitoring) is protective of human health and the environment.

### **VI. NEXT FIVE YEAR REVIEW**

The next five year review will be conducted by June, 2005, which is five years from the date of this review.

